CLAIMS

1. Process to simulate the response of a radiation detector (D) detecting radiation emitted by radioactive objects (16), these objects containing radioelements or mixes of radioelements, this process being characterized in that:

- radioactive emission spectra representative of radioelements or mixes of radioelements are memorized,
- the detection characteristics of the detector (D) are determined,
- the operating characteristics of received radiation are determined,
- radioelements or mixes of radioelements among those for which spectra have been memorized are selected, and
- the detection characteristics and operating characteristics are processed so as to individually reproduce the radiation emitted for the chosen radioelements or mixes of radioelements, to obtain the simulated detector response.

2. Process according to claim 1, in which the detection characteristics comprise data representative of the thickness through which the radiation passes before it is detected.

3. Process according to either of claims 1 or 2, in which the operating characteristics also include the aperture angle of the detector (D), detected energy bands and electronic amplification characteristics of the detector.

4. Process according to any one of claims 1 to 3, in which the regression straight lines are also built up starting from the simulated response.

5. Process according to any one of claims 1 to 4, in which the detector (D) is a γ radiation detector.

6. Process according to any one of claims 1 to 5, in which the objects are nuclear fuel elements (16).

7. Process for the inspection of a set of nuclear fuel elements (16) using the process according to claim 6, inspection process in which:

- the real composition of any of the elements of the assembly is analyzed,
- the detector (D) is calibrated with this element for which the real composition has been analyzed,
- the simulated response is corrected using the response of the detector obtained during calibration, and
- all elements are inspected.

8. Process according to claim 7, in which the elements are nuclear fuel rods (16), these rods including stacks of pellets (5) of this nuclear fuel.

9. Process according to claim 8, in which the detector (D) comprises an annular scintillator (1).

10. Process according to either of claims 8 or 9, in which the detector (D) uses a sodium iodide scintillator (1).